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ABSTRACT

This paper describes a study that addressed problems related to the disparity in achievement between disadvantaged and nondisadvantaged students. The first part of the study consisted of an analysis of three early intervention programs: the Responsive Early Childhood Education Program, the Reading Recovery program, and the Success for All program. The analysis identified program elements designed to improve student learning. From the analysis, objectives were developed to guide the second part of the study. These objectives were to: (1) identify successful models of intervention in the early grades; (2) examine how the implementation of early intervention strategies is related to the design of long-range disparity remediation plans; (3) develop, test, and evaluate a training module for principals who are implementing school-based disparity remediation plans. In the second part of the study, a case scenario that involved a desegregated urban school with a large number of low achievers was developed and incorporated into a training module, and the use of this module by eight elementary school principals was evaluated. The evaluation revealed that problem-based learning provided opportunities for new learning, produced a "think tank" experience for the participants, and improved the principals' awareness and understanding of related research. (DR)

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Closing the Achievement Gap: A Model for Success

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In 1966, James Coleman's study, "Equality of Educational Opportunity,: showed black students lagging far behind their white counterparts in educational achievement. Twenty-six years later, after the implementation of numerous intervention programs and reform efforts, the gap between the educational achievement of black and white students is still extremely large. Although the achievement gap between black and white students has decreased somewhat during the past decade, the large disparity that still exists between these two groups is unacceptable (Mullis, Owen, & Phillips, 1990).

National Assessment of Educational Progress

The National Assessment of Educational Progress (NAEP) is often referred to as "The Nation's Report Card." This report is prepared by the Educational Testing Service and it assesses the achievement of American students in grades 4, 8, and 12.

The NAEP reading assessments conducted from 1971 to 1988 indicate a reduction in average performance differences between black and white students at all three age levels. The greatest performance gap reductions occurred with the 17-year old students (12th graders). The NAEP reading and math results are based on proficiency scales of 150 to 350. The scale was set to span the range of student performance across the three grades. The scale has a mean of 250.5. The figures used in this study, however, represent performance differences between scaled scores.

The differences dropped from 53 to 20 points over a period of 16 years. Although these reductions are encouraging, the reduction in the performance

gap is less evident among the younger students. During the same period, the differences for 9-year old students dropped from 44 to 29 points (Mullis et al, 1990).

Further analysis reveals that not only do these differences remain large, but the time period for achieving such modest reductions is extremely long. The performance gap in reading for 4th graders dropped by 15 points over a period of 17 years. The performance gap in mathematics for 12th graders dropped by 11 points over a period of 13 years.

These findings imply that we are less successful in closing the performance gap during the most critical years of a student's educational career - the early years of school. Furthermore, this trend, if allowed to continue, will require more education dollars in the upper grades for the purpose of remediating students.

Purpose of the Study

This study begins with the analysis of three distinct early intervention programs: (a) Responsive Early Childhood Education Program, (b) Reading Recovery, and (c) Success for All. I attempt to show that effective intervention in the early grades tends to minimize the need for remediation as students progress through the educational system. To the extent that early intervention efforts are successful, the disparity in achievement between black and white students is reduced.

Each program will be critically examined to identify elements designed to improve student learning and the documented effectiveness of the program. These programs will be analyzed in the section on the review of the literature.

Early intervention refers to the various strategies available to recognize, diagnose, and treat symptoms of underachievement at an early stage. The

building principal's ability to recognize, diagnose, and successfully treat symptoms of underachievement is directly related to his/her ability to purposefully create change. As a result, careful attention must be given to the process of change.

The methodology for developing and field testing a problem-based learning module on achievement disparity will be discussed. In problem-based learning, a problem-oriented experience that reflects a real world situation is presented to students. The students must select the knowledge needed to solve the problem. In this study, a problem-based learning module was designed to give building principals the opportunity to apply research on early grade intervention to the practical problems of local level school improvement. The next section is used to review the results of the learning module experience. Finally, the summary, conclusions, and recommendations are provided.

Project Objectives

This study attempted to address three major concerns: (a) the seriousness of the achievement disparity problem, (b) the lack of an accessible knowledge base concerning achievement disparity programs, and (c) the inadequacy of existing training programs for principals in the design and implementation of effective disparity remediation programs. Five objectives were used to guide this project:

1. To identify early grade intervention models that have been successful in improving the academic achievement of disadvantaged students.

2. To examine how the implementation of change efforts and early intervention strategies are related to the design of long-range disparity remediation plans.

3. To develop a training module that can be used to assist building principals in developing school-based disparity remediation plans.

4. To field test the training module.

5. To evaluate the implementation of the training module and use the information gained from the evaluation for refinement.

REVIEW OF LITERATURE

The issue of disparity remediation obviously involves efforts to accelerate the achievement of low achieving students. The NAEP results cited earlier demonstrate the need for a means to help students make substantial gains in achievement during a short period of time. The issue for discussion in this section is how to accelerate achievement and when should these efforts begin. Are there any programs that have been successful in accelerating the academic achievement of low-performing students? Furthermore, do we begin efforts to accelerate achievement after failure has occurred or do we begin intervention efforts during the early stages of academic deficiencies?

For the purpose of clarity, I use the term "early grade intervention" to refer to strategies used in the primary grades, K-3, to prevent or identify and correct learning deficits. I continue this section with a review of the three early grade intervention programs mentioned earlier. Although I will use the term "early grade intervention" to refer to these programs, it should be noted that these programs are generally classified as "early childhood education" or "early intervention" programs.

Responsive Early Childhood Education Program (RECEP)

The Goldsboro City Schools sought to address problems in increasing low achievement as a result of inner city flight by focusing on early intervention strategies that would prepare students for success in school. Initially, a Head Start program was started for low-income children. The success of this program prompted the school administrators in Goldsboro to become concerned about intervention strategies during the early years of regular schooling. In order to build "upon gains that low-income children had made in Head Start or similar preschool programs" (Goldsboro, 1987, p. 6), RECEP finally evolved. RECEP received national validation in 1981.

All K-3 students in the Goldsboro City Schools participate in RECEP. "RECEP is designed to improve children's life chances by: (1) increasing their learning of the basic skills of language and mathematics: (2) developing their problem-solving abilities: and (3) fostering positive attitudes towards learning" (Goldsboro, 1987, p. 2). This is done through the six program components of RECEP:

(1) Instructional services

(2) Health services (medical and dental)

(3) Social services

(4) Nutritional services

(5) Psychological services

(6) Parent involvement

Since all K-3 students in Goldsboro must participate in RECEP, evaluation data is based on comparisons to other students in North Carolina using the California

Achieve.nent Test.

In regard to program effectiveness, the RECEP students scored better than or equal to 49.1% of all other comparable students in reading. In language arts, RECEP students scored better than or equal to 54.1% of all other comparable students. In mathematics, RECEP students scored better than or equal to 53.1% of all other comparable students. Normal curve equivalent (NCE) scores range from a low of 1 to a high of 99, with 50 denoting average performance. NCE scores indicate the percentage of students in the same grade obtaining scores equal to or less than that score.

The RECEP students scored 3.4 NCEs higher than the state's population in reading, 4.2 NCEs higher in language arts, and 1.6 NCEs higher in mathematics. No information is provided on the gains of both groups from first grade to third grade.

Conclusion

The Responsive Early Childhood Education Program has several components that contribute to the knowledge base about the design and implementation of effective early grade intervention programs. First, the academic achievement goals of RECEP are both immediate and long-term. Second, RECEP uses a comprehensive approach to address each child's academic, physical, emotional, and social needs. This approach to comprehensive education at the earliest stage possible, and for a sustained period in order to build a foundation, is consistent with Peterson's (1987) premise about the relationship between a positive (or healthy) environment and a child's cognitive development. Third, RECEP enhances the existing curriculum.

RECEP emphasizes the instructional approach, not the instructional materials. Finally, RECEP gives considerable attention to parent empowerment and ongoing staff development.

Reading Recovery - Columbus Public Schools

Reading Recovery is an "early intervention" (Allington & Johnston, 1989, p. 343; Pinnell, DeFord, & Lyons, 1988, p. 1) program for first grade students. All children selected for Reading Recovery must be in the lowest 20 percent reading achievement of their first grade class.

"The central component of the program is an expert teacher who knows how to observe and record children's literacy development and to tailor instruction specifically to the child's needs" (Allington & Johnston, 1989, p. 343). The expert teacher is referred to as the "teacher leader." In addition, all program teachers must participate in a year of staff development which includes ongoing teacher observations. This process provides additional opportunities for the types of collaborative efforts that are essential to improving the achievement of at-risk students.

In regard to the effectiveness of Reading Recovery, of the 136 Reading Recovery students in the Columbus Public Schools in 1985-86, at least 99 students, or 73%, of the students were successfully discontinued from the program at various times during the school year and received no further treatment. The successfully discontinued Reading Recovery students performed better than each of the other groups of students - not-discontinued Reading Recovery students, comparison students (students who participated in a remedial program), and random sample students - in all of the seven program measures.

The results of the intital study and the sustained effects study are consistently in the favor of the successfully discontinued Reading Recovery students. The not-discontinued Reading Recovery students and the comparison students consistently scored below the successfully discontinued Reading Recovery students. As a group, the Reading Recovery students consistently performed better than the comparison students.

The most impressive results, however, involve the comparisons between the successfully discontinued Reading Recovery students and the random sample students. Even in cases where the random sample student performed better than the successfully discontinued Reading Recovery students, it is impressive to note that the same students who started first grade at the bottom 20% of the class, attained scores that were comparable to the scores of the random sample students during a period of one to three years (Pinnell et al, 1988).

Conclusion

The Reading Recovery Program has several qualities that are helpful in understanding the design and implementation of effective early grade intervention programs. The most outstanding quality is probably the fact that Reading Recovery is clearly an example of accelerated learning. Early grade intervention programs, by definition, have to accelerate the academic performance of disadvantaged students. They must promote cognitive development in such a way to accelerate achievement and prevent regression in the future.

Another quality involves the type of investments made in Reading Recovery. Priority is given to program investments in the teacher rather than teaching

materials. It was noted earlier that RECEP uses a similar approach.

A final quality involves the mastery of skills to exit the program. This practive reinforces Peterson's (1987) premises on early intervention. High expectations during the early stages of cognitive development help develop the foundation for subsequent learning.

Success For All

The Success for All program is based on two essential principles: prevention and immediate, intensive intervention. Prevention refers to avoidance of learning problems by providing high quality programs which focus on learning and parental support of learning. Likewise, when learning problems appear, "corrective interventions must be immediate, intensive, and minimally disruptive to students' progress in the regular program" (Madden et al, 1989, pp. 3-4). Success for All attempts to prevent learning deficits by offering a "comprehensive approach emphasizing early education, improvement in instruction and curriculum, and intensive intervention at the earliest possible stage when deficits first begin to appear" (Madden, Slavin, Karweit, Dolan, Wasik, 1991, p. 2).

Success for All consists of nine program components (Madden et al, 1991; Madden et al, 1989; Slavin et al, 1990): (a) reading tutors; (b) reading programs; (c) eight-week reading assessments; (d) preschool and kindergarten; (e) family support team; (f) program facilitator; (g) teachers and teacher training; (h) special education; and (i) advisory committee.

In regard to program effectiveness, Success for All students achieved positive outcomes in most cases. The fact that comparison groups were used at all grade levels, for all types of Success for All schools, means we can be more

confident in the results. Furthermore, the multi-year approach of the Success for All evaluation design enhances the validity of the program results.

While it is noteworthy that the Success for All students performed better than the control students, it is important to mention that both groups had pretest scores that were almost identical. The students were matched on the basis of standardized test scores. Fall Boehms and Metropolitans were used to match preschool and kindergarten students, respectively. Spring California Achievement Tests were used to match students in grades 1-3 (Madden et al, 1989). The fact that treatment and control students were matched on pretest scores gives more reason to attribute the favorable outcomes to the implementation of the Success for All program.

Conclusion

Success for All embodies Peterson's (1987) premises on early intervention to the fullest extent by providing a sequential program from pre-kindergarten to third grade. By the time a Success for All student completes third grade, he/she has experienced at least five years of sequential instruction.

Synthesis of the Research

Although we know enough about the criteria of at-riskness to assign labels, our knowledge about early grade intervention is still speculative. The research reviewed in this study, however, tends to suggest the following about the conceptual, design, and implementation aspects of early grade intervention programs.

Conceptual Aspects

The premises of early intervention during the pre-kindergarten years are

generally applicable to intervention efforts during the early grades of elementary school - kindergarten through third grade. Early learning serves as a foundation for subsequent learning (Peterson, 1987).

Second, early grade intervention involves the relationship between the learning environment and the child's cognitive development. Third, early intervention can make a significant difference in the developmental status of young children faster than later remedial efforts. Fourth, there appears to be a difference between early grade intervention and remediation. Fifth, early grade intervention includes involvement and empowerment of parents and teachers. At risk students normally have at-risk parents. As a result, the intervention program must extend into the child's community and home (Peterson, 1987).

Finally, a belief system in the conceptual aspects of early grade intervention listed will probably create radical changes in the organizational structure of urban elementary schools. Therefore, early grade intervention involves restructuring the educational delivery system. Restructuring the educational delivery system means creating change.

Design Aspects

The research in this study reveals several characteristics about the possible design of early grade intervention programs. The use of short-term and long-term goals for achievement is probably the most important of all of the design characteristics. Each program gave serious consideration to longitudinal studies as well as immediate achievement results. In addition, several of the design aspects were directly related to instruction. The programs seemed to place more emphasis on instructional approaches, instead of instructional materials.

Implementation Aspects

In regard to the possible implementation aspects of early grade intervention programs, four characteristics were evident in the literature: (a) ongoing staff development; (b) an extension of instructional leadership responsibilities beyond the principal; (c) ongoing monitoring; and (d) collaborative planning.

METHODOLOGY

The research and development cycle was used to develop a learning module on achievement disparity and early grade intervention. The learning module was used to help building principals design achievement disparity plans which use early grade intervention as the primary focus. According to Borg and Gall (1989), there are several steps to the research and development cycle. The major steps are as follows:

1. Research and information collecting
2. Planning
3. Develop preliminary form of product
4. Preliminary field testing
5. Main product revision
6. Main field testing
7. Final product revision
8. Dissemination and implementation

The learning module used in this study was based on the problem-based learning process. Problem-based learning in the area of school administration is essentially a training model "that makes the connections among research,

theory, and practice more evident and applicable to the practice of administrative leadership" (Hallinger & McCary, 1990, p. 95). In this case, research refers to the literature on the three early grade intervention programs and other sources identified by the participants; theory, in particular, refers to Peterson's premises on early intervention; and practice involves the experiences of the learning module participants. According to Hallinger and McCary (1990. p. 103), "If principals are viewed as problem solvers who work in complex, contextually varying environments, leadership training must prepare them to consider the conditions under which varying leadership strategies might be applied."

The researcher developed a case scenario involving a desegregated urban school (Winzie School) with a large number of low achievers. The learning module activities were based on the development of a three-year disparity remediation grant proposal for funding by a $90,000 grant from a private foundation (the Whitmore Foundation).

The product specifications included (a) a three-year grant proposal; (b) a 20-minute presentation to the foundation panel; (c) an integrative essay (not to exceed two double-spaced, typewritten pages) which reflects what each team learned during the project; (d) a brief plan from each team member related to his/her current school assignment (optional); and (e) the completion of several evaluation instruments.

The format for the three-year grant proposal is listed below:

1. Definition of the problem(s) at Winzie School.

2. A plan for addressing the problem(s) at Winzie School. The plan should include: (a) the rationale for addressing the problem; (b) the key early

grade intervention strategies for reducing/ eliminating achievement disparity; (c) sample activities; (d) thesequence for implementing the key strategies and activities; and (e) the rationale for the selection of the sequence.

The learning module also included mock information on standardized test results and staffing. Finally, the learning module included a list of resources for early grade intervention, organizational change, and grant writing.

The main field test was used to determine if the performance objectives of the product, in this case the learning module, were met (Borg & Gall, 1989). The researcher recruited 8 elementary school principals in the Little Rock School District for the main field test. Two teams of principals (four principals on each team) were formed for the purpose of using the learning module.

Multiple methods of collecting data were used in this research and development project. "The rationale for this strategy is that the flaws of one method are often the strengths of another, and by combining methods, observers can achieve the best of each, while overcoming their unique deficiencies" (Denzin, 1970, p. 308). In addition to the long-range plan and the integrative essay, the evaluation instruments included the Meeting Process Form, the Project Process Form, the Talkback Sheet, the Early Grade Intervention Checklist, and observation notes. The results provided in the next section are based solely on the responses given on one or more of these instruments.

RESULTS

The purpose of this section is to review the results of the Winzie School learning module. In regard to the five project objectives listed in the first section

of this study, the first four of these objectives were addressed in the sections on review of the literature and methodology. The fifth objective, the evaluation of the effectiveness of the learning module, is addressed in this section through the evaluation of the three learning objectives for the Winzie School learning module.

The first learning objective of the learning module addresses organizational change theory and collaborative school-based planning in the development of a disparity remediation plan. The two teams of elementary principals demonstrated their understanding of organizational change in different ways. The Green Team reflected on the philosophy of change as opposed to developing concrete change strategies for Winzie School. The Yellow Team was very specific about the strategies that would be used to implement change. In both cases, however, the teams recognized that change takes time and commitment. The change process prescribed by the Yellow Team supports the proposition that the individuals directly affected by the process of change must be the primary change agents (Allington & Johnston, 1989; Pinnell et al, 1988).

The principals also seemed to understand the relationship between organizational change and collaborative planning. Collaborative planning facilitates the implementation of organizational change (Allington & Johnston, 1989; Pinnell et al, 1988). The learning module allowed the principals to actually experience the dynamics of collaborative planning. These experiences, which were facilitated by the problem-based learning approach provided practical examples of theoretical concepts. One principal described this approach as a "think tank/idea bank" process.

The second learning objective addresses the extent to which the principals

reviewed, understood, and used the research on early intervention strategies. The responses on the Talkback Sheets, the integrative essays, and the actual long-range plans clearly show that these aims were accomplished. In addition to these accomplishments, several observations should be noted.

First, the teams did not rely solely on the resources listed in the bibliographies. Additional resources were used in several instances. The second observation also relates to the acquisition of knowledge and self-directed learning skills. The learning module was relevant to the experiences of the building principals. As a result, the principals were able to internalize the new knowledge acquired from the early intervention research. This observation relates to some of the key principles of adult learning theory (Knowled, 1990).

Both teams used research on parent involvement as a strategy for early grade intervention. The research was exemplified by specific strategies to develop a close connection and active relationship between the school family and the home family.

In regard to the third learning objective, the Early Grade Intervention Checklist (a list of 40 early intervention strategies identified in various research articles) was used to determine if the learning module made a difference in the principal's perspective of early grade intervention strategies. Prior to beginning the learning module, the teams were asked to identify any early intervention activities on the checklist that had been used by at least one team member during a principalship experience. Next, the teams were asked to review the activities that had been selected and identify five of these activities, in the team's opinion, that were the most effective. The teams were asked to put the five most effective

activities in rank order. This process was repeated after the learning module in regard to activities included in each team's long-range intervention plan.

Each team changed its selection of activities and priorities after the learning module experience. The changes represented higher ratings of levels of effectiveness or direct substitutions for certain activities. Although the teams were not asked to explain these changes, it seems apparent that traditional practices were abandoned on the basis of new knowledge gained through the learning module experience. It is also apparent that the teams integrated old practices with new knowledge to produce configurations that would do a more effective job, at least in the opinion of the team members, of implementing early intervention strategies. Each team complied with the product specifications in the learning module.

The prioritized activities selected after the completion of the learning module are listed below. Table 1 shows the Green Team results, and Table 2 shows the Yellow Team results.

Table 1

Premodule and Postmodule Priorities Selected by Green Team

Priority	Pre module	Post module
1	Prekindergarten	Training parents to be "teachers" at home
2	Training parents to be "teachers" at home	Attention to cultural diversity
3	Classroom change strategies	Ongoing staff development
4	Ongoing staff development	Ongoing coordination/ collaboration
5	Ongoing coordination/ collaboration	Parent involvement program

Table 2

Premodule and Postmodule Priorities Selected by Yellow Team

Priority	Pre module	Post module
1	Ongoing staff development	Ongoing staff development
2	Special assistance in reading/math before first grade	Strategies to promote organizational change
3	Ongoing coordination/ collaboration	Ongoing coordination/ collaboration
4	Individualized instruction	Frequent dialogue for teaching and learning
5	Classroom observations by peers	Parent involvement related to intervention

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The first section ended with a list of five project objectives used to guide this study. The purpose of this section is to summarize each project objective and draw conclusions/recommendations, where possible.

Identification of Successful Early Intervention Models

It can be concluded from the review of the literature that a few successful early grade intervention programs are in existence. The three programs in this study, for the most part, have demonstrated their effectiveness by their ability to maintain gains over a period of years. This is the focus of early grade

intervention - to prevent remedial needs that might otherwise occur in the future. Furthermore, the three programs tend to share certain conceptual, design, and implementation aspects.

Change, Intervention, and Disparity Remediation

The Yellow Team reaffirmed Allington and Johnston's (1989) assertion that the change process is facilitated by collaborative efforts among staff members. Furthermore, organizational change was regarded as an important prerequisite to program implementation.

It can be concluded that early grade intervention causes long-range change in several ways. Early grade intervention means a change in perspective, educational philosophy, instructional strategies, and instructional skills.

Develop a Training Module

Several things can be learned from the use of the Winzie School learning module to assist building principals in developing school-based disparity remediation plans. First, as stated by one of the principals, problem-based learning provides opportunities for new learning and produces a huge "think tank/idea bank" experience for the participants. The "think tank/idea bank" nature of problem-based learning enhances collaborative planning and facilitates the development of long-term strategies.

Second, the Talkback Sheet responses were consistent with Leithwood and Steinbach's theory on ensuring the transfer of knowledge through the use of authentic problems and settings (1992). Third, problem-based learning, as evidence at least by the Winzie learning module, improves the principals' awareness and understanding of related research. Finally, problem-based

learning enhances the collection of resources needed to develop long-range plans.

Field Test the Training Module

It can be concluded from the integrative essays and the responses on the Talkback Sheets that the main field testing was successful. Over a period of five two-hour sessions, the training module provided active experiences with adult learning theory, collaborative planning, strategic planning, and early grade intervention research.

Evaluation of Training Module

The final project objective was to evaluate the implementation of the training module and use the information gained from the evaluation for refinement. Positive results were evident from the Project Process, Meeting Process, and Talkback Sheet responses.

Recommendations

This study sets the stage for further research in several areas. Overall, the Winzie School learning module needs to be conducted with more urban school principals from different geographical areas. Such an expansion would serve as a significant step toward exposing the researcher and the participants to the best thinking, research, and strategies available to solve the achievement disparity problem.

Next, there is considerable research already available on the cognitive development that occurs during the primary grades. There is a need to correlate developmental research and the instructional strategies used by successful early grade intervention programs. Such a correlation should strengthen the argument in support of early grade intervention.

Another area of research involves the transfer of problem-solving skills from the instructional setting to the real-life administrative setting (Leithwood & Steinbach, 1992). This research should show the extent to which building principals actually use their learning module experiences in their respective "real-life administrative settings."

In closing, there is a dire need to elevate the issue of disparity remediation to the forefront of the national agenda on education. The differences in achievement between black and white students are consistently alarming. What is more alarming, however, is the scarcity of research devoted to finding ways to "close the gap!"

This study makes a significant contribution to the field of education because it shows the magnitude of the achievement disparity problem; it promotes a new approach to improving the achievement of at-risk students - early grade intervention; it documents the successes of three early grade intervention programs; and it demonstrates the effectiveness of problem-based learning as a tool for administrative training. Hopefully, more studies will follow.

This study should be viewed as the beginning of a long-term effort in urban education to combine the best thinking, research, and strategies available to solve the disparity remediation problem.

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